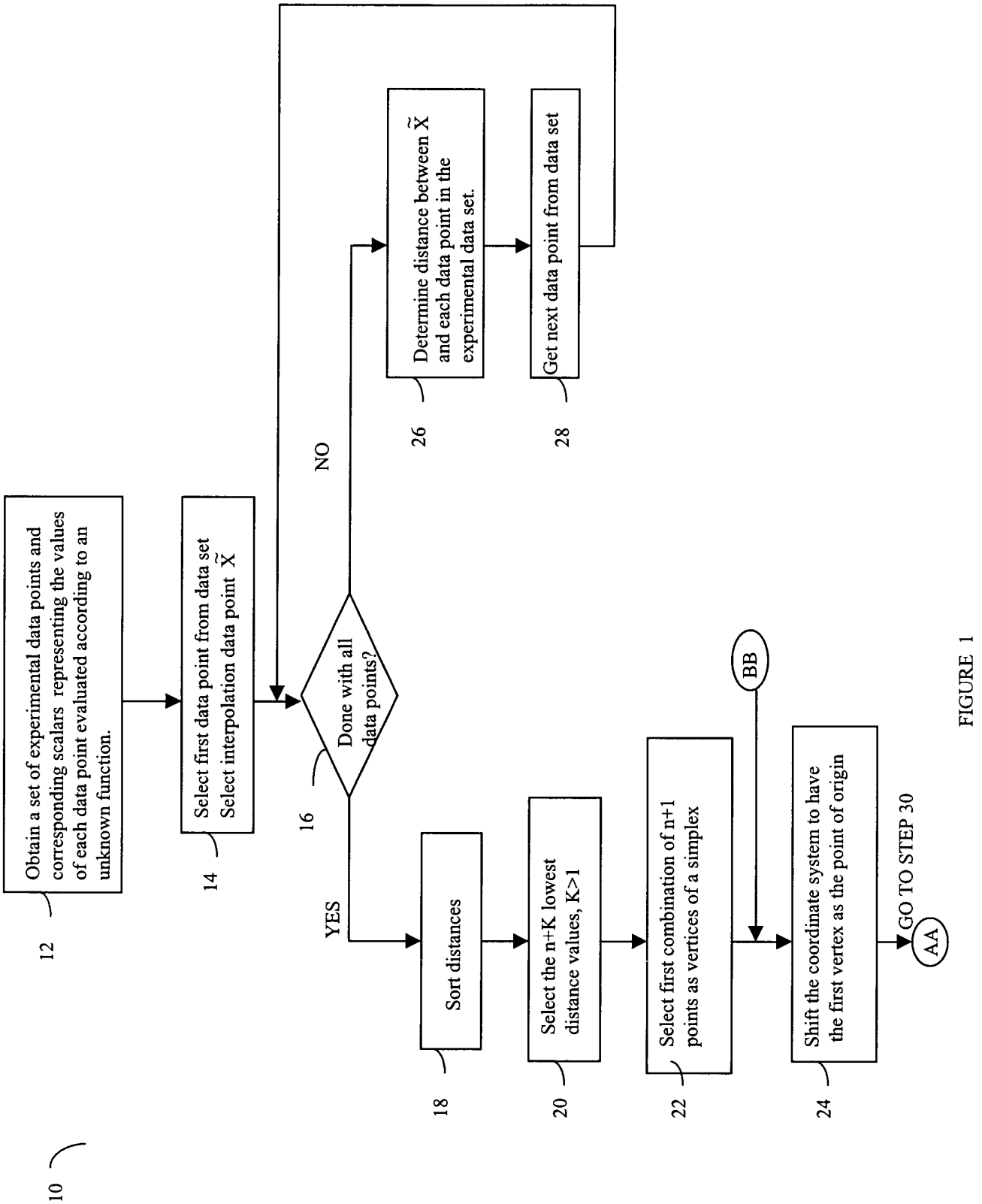

10
12
Obtain a set of experimental data points and corresponding scalars representing the values of each data point evaluated according to an unknown function.
14
Select first data point from data set
Select interpolation data point $\tilde{X}$
16
Done with all data points?
NO
YES
26
Determine distance between $\tilde{X}$ and each data point in the experimental data set.
28
Get next data point from data set
18
Sort distances
20
Select the n+K lowest distance values, K>1
22
Select first combination of n+1 points as vertices of a simplex
BB
24
Shift the coordinate system to have the first vertex as the point of origin
GO TO STEP 30
AA

FIGURE 1

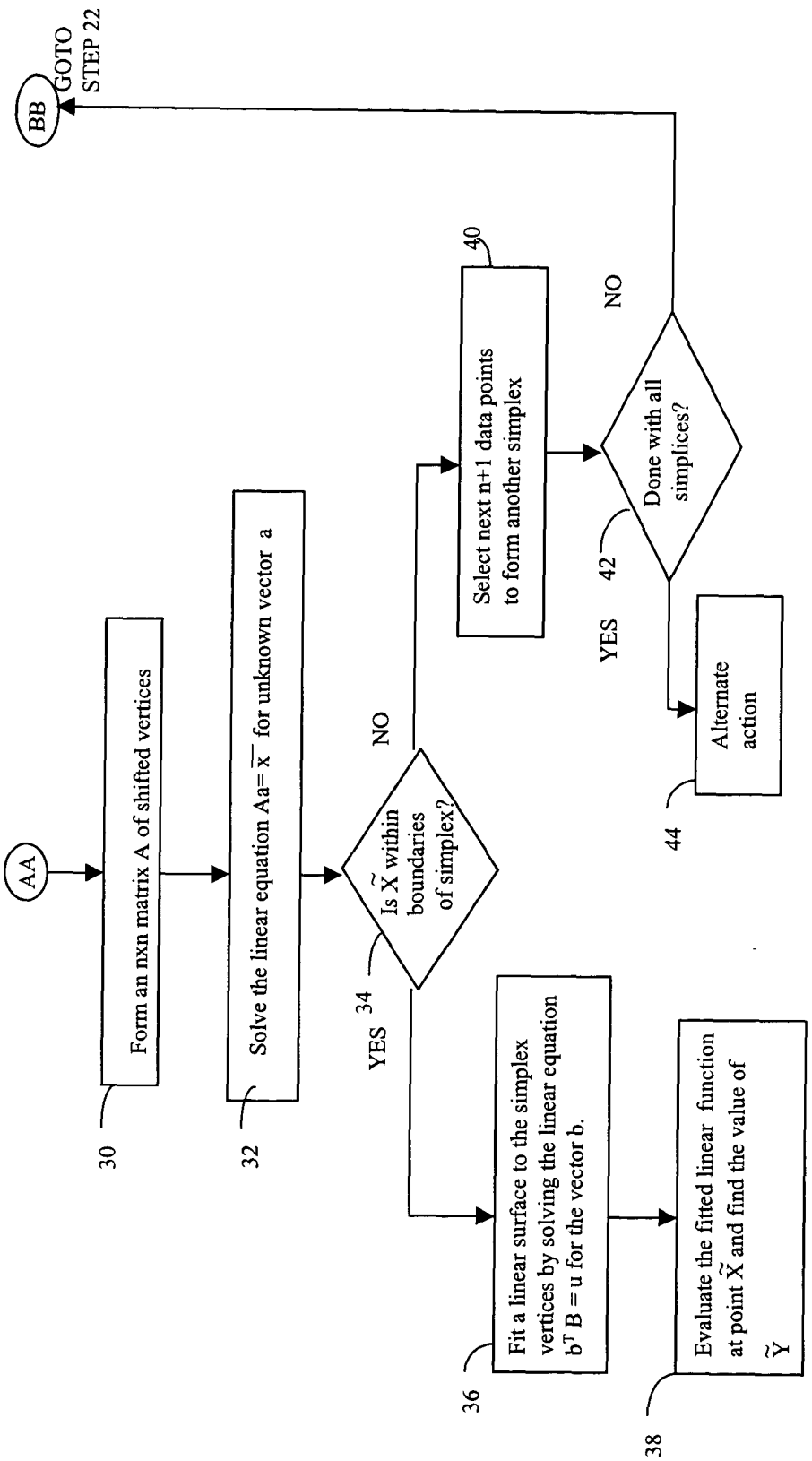

AA
Form an nxn matrix A of shifted vertices
30
Solve the linear equation Aa= $\overline{x}$ for unknown vector a
32
Is $\tilde{X}$ within boundaries of simplex?
34
NO
YES
Select next n+1 data points to form another simplex
40
Done with all simplices?
42
NO
YES
Alternate action
44
Fit a linear surface to the simplex vertices by solving the linear equation $b^T B = u$ for the vector b.
36
Evaluate the fitted linear function at point $\tilde{X}$ and find the value of $\tilde{Y}$
38
BB
GOTO STEP 22

FIGURE 2

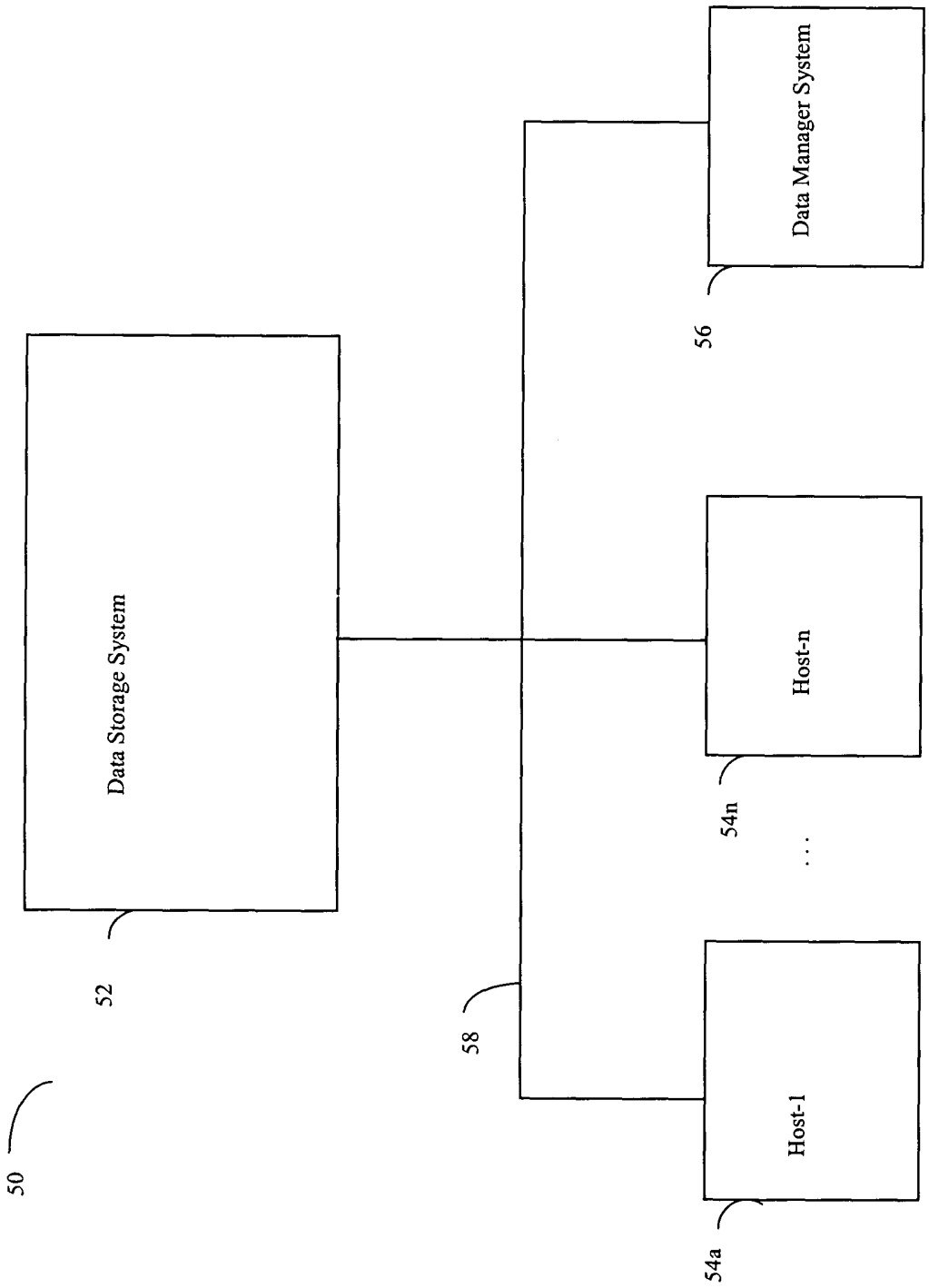
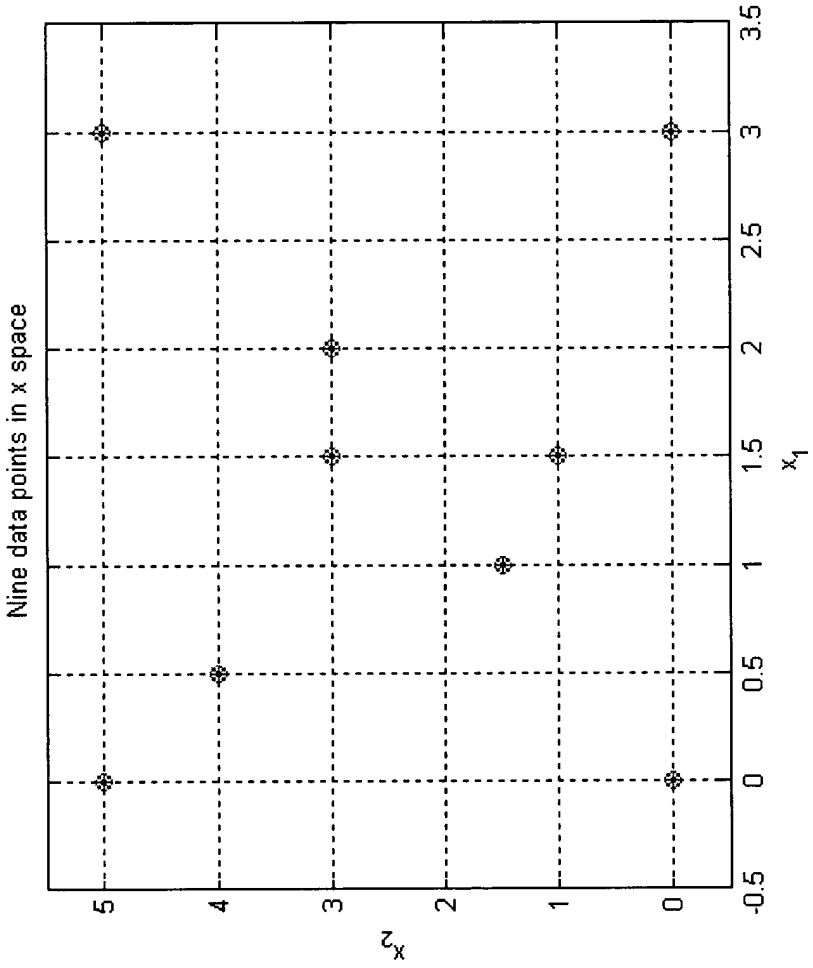
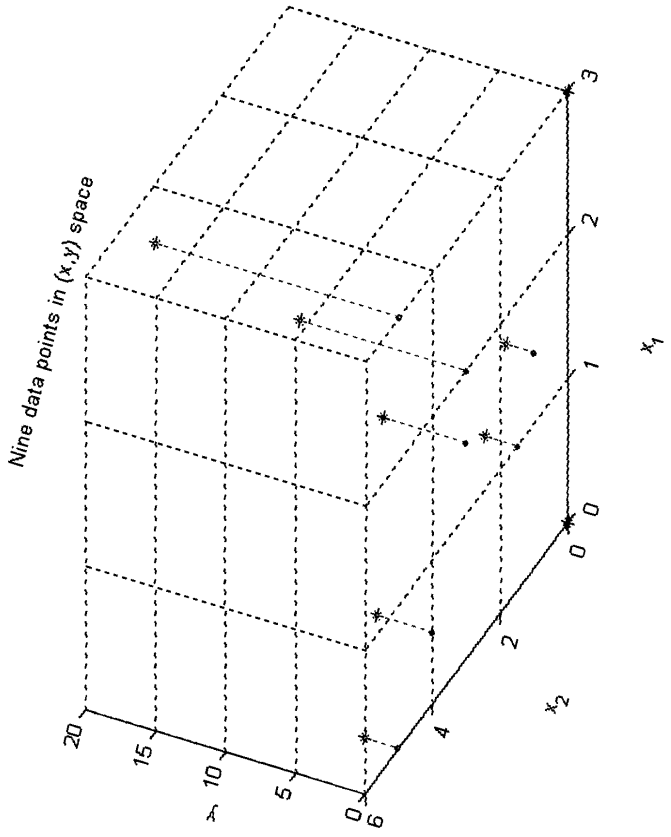

Data Storage System
52
50
58
Data Manager System
56
Host-n
54n
Host-1
54a

FIGURE 3



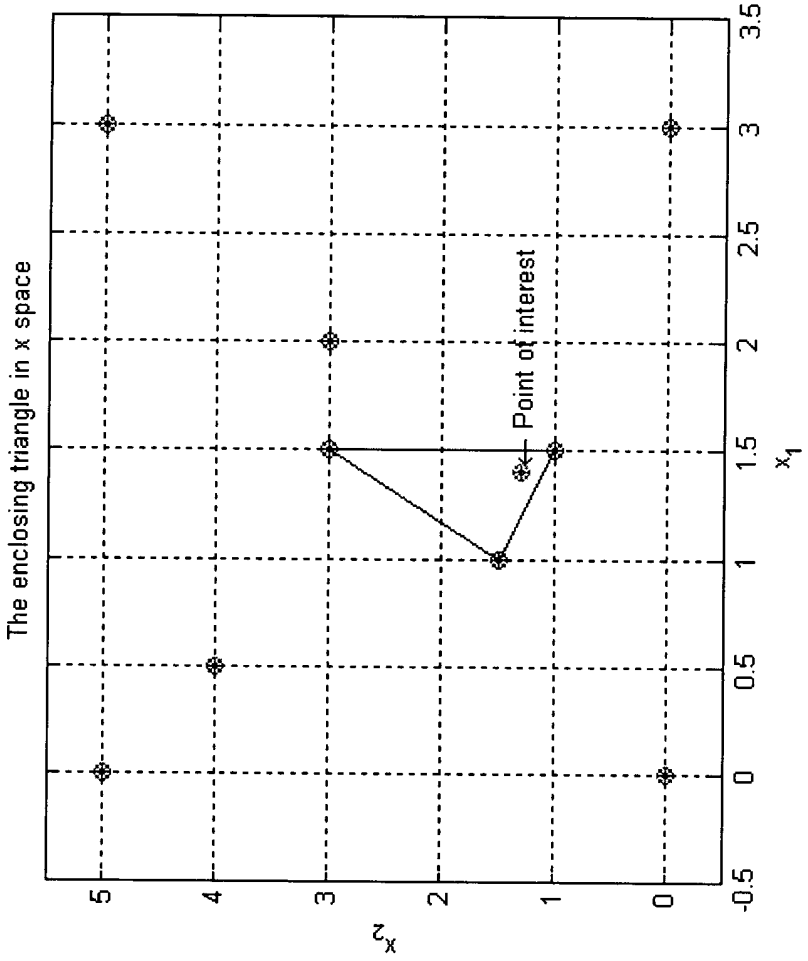
80

FIGURE 4



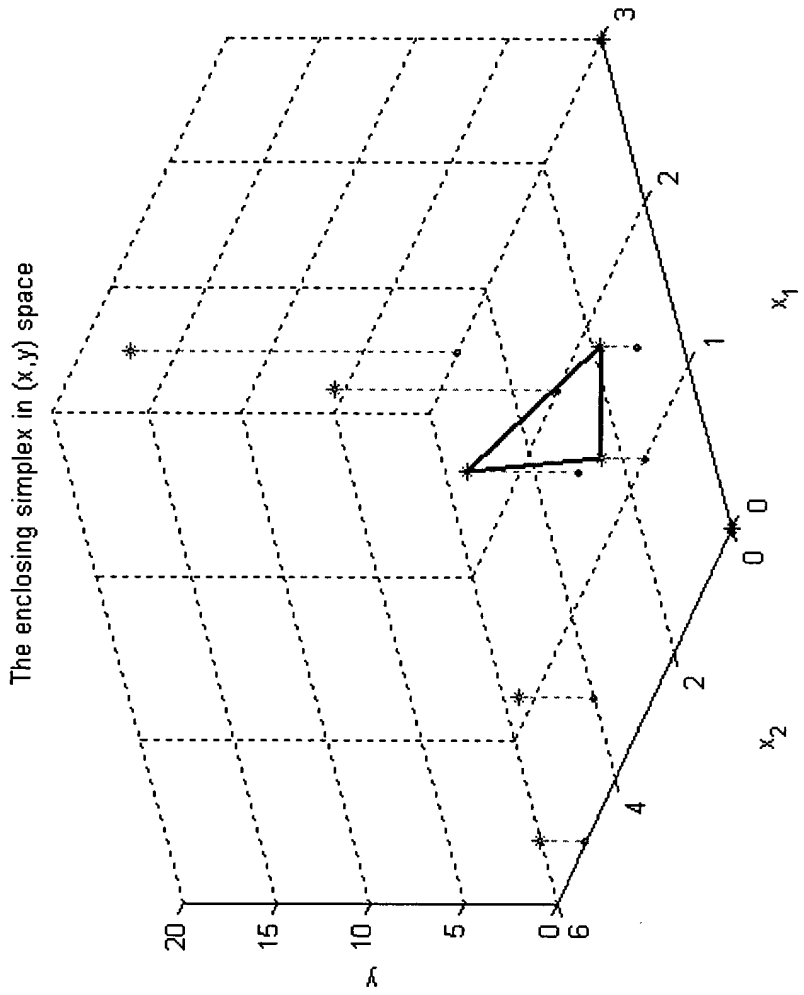
100

FIGURE 5


The enclosing triangle in x space
Point of interest
x_1
x_2
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
5
4
3
2
1
0

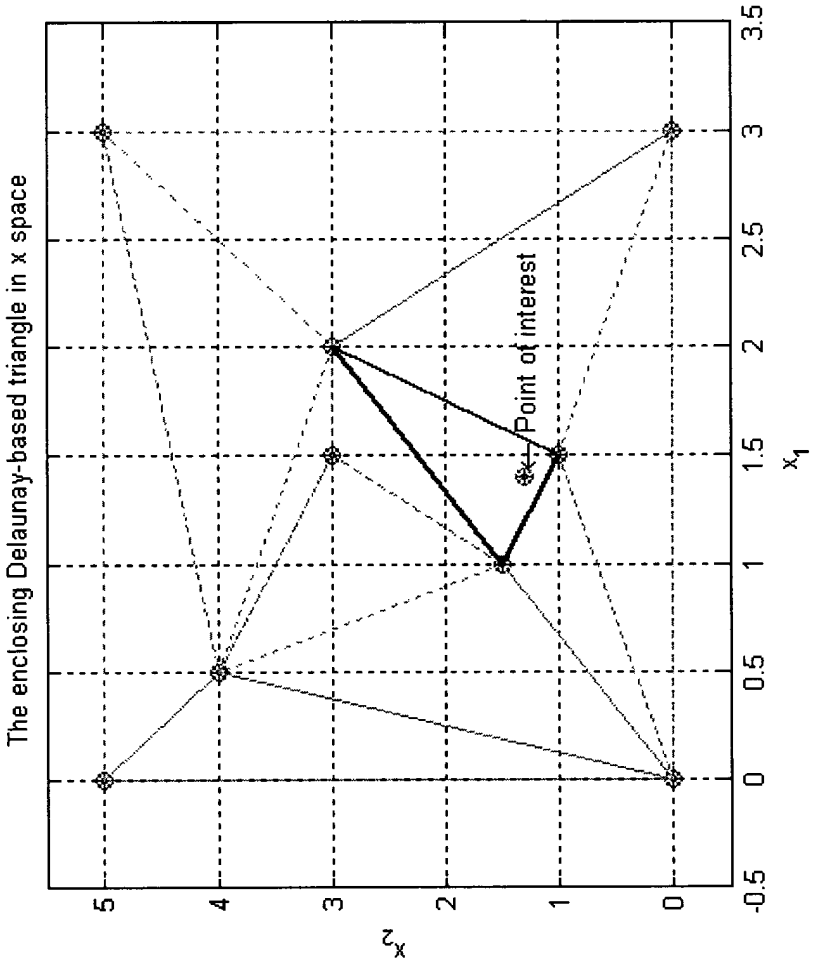
200

FIGURE 6



300

FIGURE 7


The enclosing Delaunay-based triangle in x space
Point of interest
x_1
x_2
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
5
4
3
2
1
0

400

FIGURE 8